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REMARKS

Claim Rejections - 35 USC §102

1. The Examiner's rejection of Claims 1-6 and 10-17 under 35 U.S.C. 102 as being anticipated by Lee 6,155,778 (figures 1-2 and 4), has been studied and the Applicants respectfully disagree with the Examiner's contention that Lee discloses "an asymmetric portion B of the cooling apertures having an asymmetrical density of aperture inlets that is asymmetric with respect to the axially extending midline." It is clear from observing the cooling apertures in Lee that in any given panel all of the cooling holes are equally spaced apart in any given row which crosses line 12 and thus there is no "asymmetrical density of aperture inlets that is asymmetric with respect to the axially extending midline." All of the densities of holes with respect to midline 12 are symmetric. While there may not be the same number of holes on the two sides of midline 12 in any given row of holes they are still all spaced equally apart and therefore the density of holes on either side midline 12 is the same and thus symmetrical not asymmetrical across midline 12.

The Applicants respectfully submit that all of the cooling holes in Lee are spaced equally apart and Lee does not disclose any high density areas of the cooling apertures. The Applicants respectfully submit that the Examiner has taken FIG. 4 out of context of the specification including the drawings in its entirety. The Examiner's contention that

> "The asymmetrical portion B of cooling apertures 64 indicated in the annotated figure of Lee below has an asymmetrical density of aperture inlets that is

asymmetrical with respect to the axially extending midline 12, because portion E is a low density area, having three cooling apertures in a single column that extends perpendicular to midline 12, adjacent to aft end 56, while portion C is a high density area, having four cooling apertures in a single column that extends perpendicular to midline 12, adjacent to aft end 56. It is clear from figure 4 that the number of cooling apertures in the single column portion E, divided by the distance from the midline to the top of the shroud segment, is less than the number of cooling apertures in the single column portion C, divided by the distance from the midline to the bottom of the shroud segment. Therefore, portion B is considered to be a low density area, and portion C is considered to be a high density area.

The Lee patent discloses apertures with outlets in portion B of Lee that are in the recesses 62 and not on the radially inner surface as called out in the Claims, amended Claim 1 and Claim 20. Thus Lee does not disclose two elements of the present claims. Lee fails to disclose "aperture outlets on the radially inner surface" and "an asymmetric portion of the cooling apertures having an asymmetrical density of the aperture inlets that is asymmetric with respect to the axially extending midline" as found in the rejected Claims.

The purpose of the recesses is to form a continuous blanket of cooling air (see Lee column 4, lines 17-56). Thus, the apertures of Lee in the area B referred to by the Examiner does not culminate at an outlet on the surface but rather in a recess in the surface (see Lee column 2, lines 8-11). The abstract in Lee clearly states:

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"The panel includes a plurality of recesses in the inner surface thereof which face tips of the blades. The recesses extend only in part into the panel for reducing surface area exposed to the blade tips."

Thus Lee clearly distinguishes the radially inner surface area of the panel which is exposed to the blade tips from the surfaces of the recesses and thus one skilled in the art would not consider Lee as having aperture outlets on the radially inner surface as found in the rejected Claims. The recesses in Lee are also designed such that "each of the slots 68 includes a plurality of the cooling holes 64 therein which feed the cooling air 16 in a similar manner for undergoing diffusion in the slots and forming a blanket of film cooling air in the downstream direction.". This appears to be contrary to both the design and functionality of the present invention in which asymmetric cooling is used. Claim 20 is not anticipated by Lee because of the same reasons.

Therefore, the Applicants respectfully submit that the amendments and remarks above overcome the Examiner's rejection of Claims 1-6 and 10-17 under 35 U.S.C. 102 as being anticipated by Lee 6,155,778 and that Claims 1-6 and 10-17 are now in condition for allowance.

Claim Rejections - 35 USC §103(a)

2. The Examiner's rejection of Claims 20 and 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee 6,155,778 in view of Proctor 5,169,287 has been studied and the Applicants respectfully disagrees with the Examiner. As shown above Lee does not teach, disclose, suggest, or even hint at "aperture outlets on the radially inner surface" and "an asymmetric portion of the cooling apertures having an

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asymmetrical density of the aperture inlets that is asymmetric with respect to the axially extending midline" as explained above.

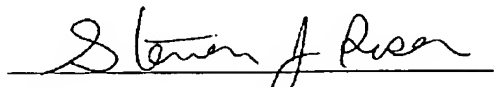
Thus, the Applicant respectfully submits that the amendments and remarks above overcome the Examiner's rejections of Claims 20 and 23-29 under 35 U.S.C. 103(a) as being unpatentable over Lee 6,155,778 in view of Proctor 5,169,287 and that these Claims are in condition for allowance.

Allowable Subject Matter

3. The Applicants would like to thank the Examiner for provisional allowance of Claims 7-9, 18-19, 21-22, and 30-35 and respectfully submit that it is too early in the prosection to rewrite these Claims in independent form where appropriate, including all of the limitations of the base Claim and any intervening Claims.

4. The Applicants respectfully submit that amended Claims 1-35 are now in condition for allowance and request that they be passed on to issue.

Respectfully submitted,



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